

**APPENDIX C. ANALYTICAL METHODS,  
REPORTING LIMITS, AND SEDIMENT COLLECTION  
JAR SUMMARIES**

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## Tables

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**Table C-1. Methods and RL goals for PCB Aroclors, cPAHS, metals, SVOCs, and conventionals in sediment/soil**

Analyte	Method	Unit	MDL	RL
<b>PCBs as Aroclors (based on 12.5-g dw sample)</b>				
Aroclor 1016	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1221	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1232	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1242	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1248	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1254	EPA 8082A	µg/kg dw	8.00 <sup>a</sup>	20.0 <sup>b</sup>
Aroclor 1260	EPA 8082A	µg/kg dw	9.28 <sup>a</sup>	20.0 <sup>b</sup>
<b>cPAHs (based on 10-g dw sample)</b>				
Benzo(a)anthracene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	0.537	5.00
Benzo(a)pyrene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	0.915	5.00
Benzo(b)fluoranthene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	1.37	5.00
Benzo(k)fluoranthene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	0.760	5.00
Chrysene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	0.488	5.00
Dibenzo(a,h)anthracene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	1.53	5.00
Indeno(1,2,3-cd)pyrene <sup>c</sup>	EPA 8270D-SIM	µg/kg dw	0.575	5.00
<b>PAHs (based on 10-g dw sample)</b>				
Acenaphthene	EPA 8270D	µg/kg dw	5.13 <sup>a</sup>	20.0 <sup>b</sup>
Anthracene	EPA 8270D	µg/kg dw	5.93 <sup>a</sup>	20.0 <sup>b</sup>
Benzo(a)anthracene	EPA 8270D	µg/kg dw	5.18 <sup>a</sup>	20.0 <sup>b</sup>
Benzo(a)pyrene	EPA 8270D	µg/kg dw	6.48 <sup>a</sup>	20.0 <sup>b</sup>
Benzo(b)fluoranthene	EPA 8270D	µg/kg dw	7.02 <sup>a</sup>	20.0 <sup>b</sup>
Benzo(k)fluoranthene	EPA 8270D	µg/kg dw	5.01 <sup>a</sup>	20.0 <sup>b</sup>

**Table C-1. Methods and RL goals for PCB Aroclors, cPAHS, metals, SVOCs, and conventionals in sediment/soil**

Analyte	Method	Unit	MDL	RL
Total benzofluoranthenes	EPA 8270D	µg/kg dw	10.2 <sup>a</sup>	40.0 <sup>b</sup>
Benzo(g,h,i)perylene	EPA 8270D	µg/kg dw	5.82 <sup>a</sup>	20.0 <sup>b</sup>
Chrysene	EPA 8270D	µg/kg dw	5.22 <sup>a</sup>	20.0 <sup>b</sup>
Dibenzo(a,h)anthracene	EPA 8270D	µg/kg dw	6.16 <sup>a</sup>	20.0 <sup>b</sup>
Fluoranthene	EPA 8270D	µg/kg dw	4.52 <sup>a</sup>	20.0 <sup>b</sup>
Fluorene	EPA 8270D	µg/kg dw	4.95 <sup>a</sup>	20.0 <sup>b</sup>
Indeno(1,2,3-cd)pyrene	EPA 8270D	µg/kg dw	5.99 <sup>a</sup>	20.0 <sup>b</sup>
2-methylnaphthalene	EPA 8270D	µg/kg dw	5.67 <sup>a</sup>	20.0 <sup>b</sup>
Naphthalene	EPA 8270D	µg/kg dw	5.25 <sup>a</sup>	20.0 <sup>b</sup>
Phenanthrene	EPA 8270D	µg/kg dw	4.69 <sup>a</sup>	20.0 <sup>b</sup>
Pyrene	EPA 8270D	µg/kg dw	5.55 <sup>a</sup>	20.0 <sup>b</sup>
<b>Metals (based on 1-g ww unless otherwise noted)</b>				
Arsenic	EPA 6020A UCT-KED	mg/kg dw	na <sup>d</sup>	0.2 <sup>b</sup>
Cadmium	EPA 6020A UCT-KED	mg/kg dw	na <sup>d</sup>	0.1 <sup>b</sup>
Chromium	EPA 6020A	mg/kg dw	na <sup>d</sup>	0.5 <sup>b</sup>
Copper	EPA 6020A UCT-KED	mg/kg dw	na <sup>d</sup>	0.5 <sup>b</sup>
Lead	EPA 6020A	mg/kg dw	na <sup>d</sup>	0.1 <sup>b</sup>
Silver	EPA 6020A	mg/kg dw	na <sup>d</sup>	0.2 <sup>b</sup>
Zinc	EPA 6020A UCT-KED	mg/kg dw	na <sup>d</sup>	4 <sup>b</sup>
Mercury (based on 0.2-g ww sample)	EPA 7471B	mg/kg dw	na <sup>d</sup>	0.025 <sup>b</sup>
<b>SVOCs (based on 10-g dw sample)</b>				
2,4-dimethylphenol	EPA 8270D-SIM	µg/kg dw	10.2	25.0
4-methylphenol	EPA 8270D	µg/kg dw	14.7 <sup>a</sup>	20.0 <sup>b</sup>

**Table C-1. Methods and RL goals for PCB Aroclors, cPAHS, metals, SVOCs, and conventionals in sediment/soil**

Analyte	Method	Unit	MDL	RL
Benzoic acid	EPA 8270D	µg/kg dw	59.1	200
Benzyl alcohol	EPA 8270D-SIM	µg/kg dw	12.1	20.0
Bis(2-ethylhexyl)phthalate	EPA 8270D	µg/kg dw	28.8 <sup>a</sup>	50.0 <sup>b</sup>
Butyl benzyl phthalate	EPA 8270D	µg/kg dw	8.05 <sup>a</sup>	20.0 <sup>b</sup>
Dibenzofuran	EPA 8270D	µg/kg dw	4.61 <sup>a</sup>	20.0 <sup>b</sup>
Dimethyl phthalate	EPA 8270D	µg/kg dw	6.44 <sup>a</sup>	20.0 <sup>b</sup>
Hexachlorobenzene	EPA 8270D-SIM	µg/kg dw	2.11	5.00
n-Nitrosodiphenylamine	EPA 8270D-SIM	µg/kg dw	2.31	5.00
PCP	EPA 8270D-SIM	µg/kg dw	10.4	20.0
Phenol	EPA 8270D	µg/kg dw	8.23 <sup>a</sup>	20.0 <sup>b</sup>
1,2,4-trichlorobenzene	EPA 8270D-SIM	µg/kg dw	1.51	5.00
1,2-dichlorobenzene	EPA 8270D-SIM	µg/kg dw	1.32	5.00
1,4-dichlorobenzene	EPA 8270D -SIM	µg/kg dw	1.91	5.00
<b>Toxaphene (based on 12.5-g dw sample)</b>	EPA 8081B	µg/kg dw	4.48 <sup>a</sup>	25.0 <sup>b</sup>
<b>Conventionals</b>				
Grain size	PSEP 1986	%	na	0.1
Percent solids	SM 2540G	% dw	na	0.040
TOC (based on 1-g dw sample)	Plumb (1981)	% dw	0.018	0.02
Black carbon (based on 10-g dw sample)	Gustafsson, 2001 - CTO Pretreatment / Combustion (950°C) / IR detect	wt%	0.2	0.6

<sup>a</sup> SW 846 no longer requires MDL values. The laboratories have the option to use these values to assess sensitivity for EPA 8000 series methods. ARI has continued to maintain MDL studies for these analytes.

<sup>b</sup> RL values are consistent with the LLOQ values required under EPA SW-846.

c Components of cPAH sum.

d SW 846 no longer requires MDL values.

BEHP – bis(2-ethylhexyl) phthalate

BHC – benzene hexachloride

cPAH – carcinogenic polycyclic aromatic hydrocarbon

DDD – dichlorodiphenyldichloroethane

DDE – dichlorodiphenyldichloroethylene

DDT – dichlorodiphenyltrichloroethane

dw – dry weight

EPA – US Environmental Protection Agency

LLOQ – lower limit of quantitation

MDL – method detection limit

na – not available

PCB – polychlorinated biphenyl

PCP – pentachlorophenol

PSEP - Puget Sound Estuary Program

RL – reporting limit

SIM – selective ion monitoring

SVOC – semivolatile organic compounds

TBT – tributyltin

total DD<sub>x</sub> – DDT isomers (2,4'-DDD, 4,4'-DDD, 2,4'-DDE, 4,4'-DDE, 2,4'-DDT and 4,4'-DDT)

ww – wet weight

**Table C-2. Method and RL goals for PCB congeners in sediment**

Analyte	EPA Method 1668C				Estimated porewater DL (ug/L) <sup>c</sup>	
	Sediment (ng/kg dw) Based on 10-g dw sample		Passive Sampler (pg/g) Based on 1-g PE sample			
	EDL <sup>a</sup>	LMCL <sup>b</sup>	EDL <sup>a</sup>	LMCL <sup>b</sup>		
PCB-1	0.1	0.4	1.0	4.0	0.6714	
PCB-2	0.1	0.4	1.0	4.0	0.3954	
PCB-3	0.1	0.4	1.0	4.0	0.7907	
PCB-4	0.2	0.4	2.0	4.0	0.8670	
PCB-5	0.2	0.4	2.0	4.0	0.4150	
PCB-6	0.2	0.4	2.0	4.0	0.3373	
PCB-7	0.2	0.4	2.0	4.0	0.3296	
PCB-8	0.2	0.4	2.0	4.0	0.3296	
PCB-9	0.2	0.4	2.0	4.0	0.3373	
PCB-10	0.2	0.4	2.0	4.0	0.5598	
PCB-11	0.2	0.4	2.0	4.0	0.2032	
PCB-12/13	0.2	0.4	2.0	4.0	0.2160 <sup>d</sup>	
PCB-14	0.2	0.4	2.0	4.0	0.2032	
PCB-15	0.2	0.4	2.0	4.0	0.1941	
PCB-16	0.1	0.4	1.0	4.0	0.1340	
PCB-17	0.1	0.4	1.0	4.0	0.1089	
PCB-19	0.1	0.4	1.0	4.0	0.1849	
PCB-21/33	0.1	0.4	1.0	4.0	0.0542 <sup>d</sup>	
PCB-22	0.1	0.4	1.0	4.0	0.0509	
PCB-23	0.1	0.4	1.0	4.0	0.0521	
PCB-24	0.1	0.4	1.0	4.0	0.0865	
PCB-25	0.1	0.4	1.0	4.0	0.0414	
PCB-26/29	0.1	0.4	1.0	4.0	0.0486 <sup>d</sup>	
PCB-27	0.1	0.4	1.0	4.0	0.0703	
PCB-28/20	0.1	0.4	1.0	4.0	0.0486 <sup>d</sup>	
PCB-30/18	0.1	0.4	1.0	4.0	0.0909 <sup>d</sup>	
PCB-31	0.1	0.4	1.0	4.0	0.0414	
PCB-32	0.1	0.4	1.0	4.0	0.0703	
PCB-34	0.1	0.4	1.0	4.0	0.0424	
PCB-35	0.1	0.4	1.0	4.0	0.0293	
PCB-36	0.1	0.4	1.0	4.0	0.0255	
PCB-37	0.1	0.4	1.0	4.0	0.0286	
PCB-38	0.1	0.4	1.0	4.0	0.0337	

**Table C-2. Method and RL goals for PCB congeners in sediment**

Analyte	EPA Method 1668C				Estimated porewater DL (ug/L) <sup>c</sup>	
	Sediment (ng/kg dw) Based on 10-g dw sample		Passive Sampler (pg/g) Based on 1-g PE sample			
	EDL <sup>a</sup>	LMCL <sup>b</sup>	EDL <sup>a</sup>	LMCL <sup>b</sup>		
PCB-39	0.1	0.4	1.0	4.0	0.0249	
PCB-41/40/71	0.1	0.4	1.0	4.0	0.0341 <sup>d</sup>	
PCB-42	0.1	0.4	1.0	4.0	0.0337	
PCB-43	0.1	0.4	1.0	4.0	0.0344	
PCB-44/47/65	0.1	0.4	1.0	4.0	0.0295 <sup>d</sup>	
PCB-45/51	0.1	0.4	1.0	4.0	0.0399 <sup>d</sup>	
PCB-46	0.1	0.4	1.0	4.0	0.0571	
PCB-48	0.1	0.4	1.0	4.0	0.0321	
PCB-50/53	0.1	0.4	1.0	4.0	0.0459 <sup>d</sup>	
PCB-52	0.1	0.4	1.0	4.0	0.0280	
PCB-54	0.1	0.4	1.0	4.0	0.1194	
PCB-55	0.1	0.4	1.0	4.0	0.0150	
PCB-56	0.1	0.4	1.0	4.0	0.0150	
PCB-57	0.1	0.4	1.0	4.0	0.0131	
PCB-58	0.1	0.4	1.0	4.0	0.0131	
PCB-59/62/75	0.1	0.4	1.0	4.0	0.0213 <sup>d</sup>	
PCB-60	0.1	0.4	1.0	4.0	0.0150	
PCB-61/70/74/76	0.1	0.4	1.0	4.0	0.0141 <sup>d</sup>	
PCB-63	0.1	0.4	1.0	4.0	0.0131	
PCB-64	0.1	0.4	1.0	4.0	0.0217	
PCB-66	0.1	0.4	1.0	4.0	0.0122	
PCB-67	0.1	0.4	1.0	4.0	0.0122	
PCB-68	0.1	0.4	1.0	4.0	0.0106	
PCB-69/49	0.1	0.4	1.0	4.0	0.0225 <sup>d</sup>	
PCB-72	0.1	0.4	1.0	4.0	0.0106	
PCB-73	0.1	0.4	1.0	4.0	0.0177	
PCB-77	0.1	0.4	1.0	4.0	0.0085	
PCB-78	0.1	0.4	1.0	4.0	0.0086	
PCB-79	0.1	0.4	1.0	4.0	0.0074	
PCB-80	0.1	0.4	1.0	4.0	0.0064	
PCB-81	0.1	0.4	1.0	4.0	0.0085	
PCB-82	0.1	0.4	1.0	4.0	0.0122	
PCB-83/99	0.1	0.4	1.0	4.0	0.0093 <sup>d</sup>	

**Table C-2. Method and RL goals for PCB congeners in sediment**

Analyte	EPA Method 1668C				Estimated porewater DL (ug/L) <sup>c</sup>	
	Sediment (ng/kg dw) Based on 10-g dw sample		Passive Sampler (pg/g) Based on 1-g PE sample			
	EDL <sup>a</sup>	LMCL <sup>b</sup>	EDL <sup>a</sup>	LMCL <sup>b</sup>		
PCB-84	0.1	0.4	1.0	4.0	0.0177	
PCB-88/91	0.1	0.4	1.0	4.0	0.0154 <sup>d</sup>	
PCB-89	0.1	0.4	1.0	4.0	0.0165	
PCB-92	0.1	0.4	1.0	4.0	0.0086	
PCB-94	0.1	0.4	1.0	4.0	0.0144	
PCB-95/100/93/102/98	0.1	0.4	1.0	4.0	0.0142 <sup>d</sup>	
PCB-96	0.1	0.4	1.0	4.0	0.0378	
PCB-103	0.1	0.4	1.0	4.0	0.0117	
PCB-104	0.1	0.4	1.0	4.0	0.0300	
PCB-105	0.1	0.4	1.0	4.0	0.0043	
PCB-106	0.1	0.4	1.0	4.0	0.0044	
PCB-108/124	0.1	0.4	1.0	4.0	0.0037 <sup>d</sup>	
PCB-109/119/86/97/125/87	0.1	0.4	1.0	4.0	0.0081 <sup>d</sup>	
PCB-107	0.1	0.4	1.0	4.0	0.0038	
PCB-110/115	0.1	0.4	1.0	4.0	0.0063 <sup>d</sup>	
PCB-111	0.1	0.4	1.0	4.0	0.0034	
PCB-112	0.1	0.4	1.0	4.0	0.0069	
PCB-113/90/101	0.1	0.4	1.0	4.0	0.0074 <sup>d</sup>	
PCB-114	0.1	0.4	1.0	4.0	0.0043	
PCB-117/116/85	0.4	2.0	1.0	4.0	0.0085 <sup>d</sup>	
PCB-118	0.4	2.0	1.0	4.0	0.0035	
PCB-120	0.4	2.0	1.0	4.0	0.0031	
PCB-121	0.4	2.0	1.0	4.0	0.0044	
PCB-122	0.4	2.0	1.0	4.0	0.0044	
PCB-123	0.4	2.0	1.0	4.0	0.0035	
PCB-126	0.4	2.0	1.0	4.0	0.0025	
PCB-127	0.4	2.0	1.0	4.0	0.0022	
PCB-128/166	0.4	2.0	1.0	4.0	0.0029 <sup>d</sup>	
PCB-130	0.4	2.0	1.0	4.0	0.0031	
PCB-131	0.4	2.0	1.0	4.0	0.0051	
PCB-132	0.4	2.0	1.0	4.0	0.0051	
PCB-133	0.4	2.0	1.0	4.0	0.0027	
PCB-134/143	0.4	2.0	1.0	4.0	0.0052 <sup>d</sup>	

**Table C-2. Method and RL goals for PCB congeners in sediment**

Analyte	EPA Method 1668C				Estimated porewater DL (ug/L) <sup>c</sup>	
	Sediment (ng/kg dw) Based on 10-g dw sample		Passive Sampler (pg/g) Based on 1-g PE sample			
	EDL <sup>a</sup>	LMCL <sup>b</sup>	EDL <sup>a</sup>	LMCL <sup>b</sup>		
PCB-136	0.4	2.0	1.0	4.0	0.0117	
PCB-137	0.4	2.0	1.0	4.0	0.0029	
PCB-138/163/129/160	0.4	2.0	1.0	4.0	0.0027 <sup>d</sup>	
PCB-139/140	0.4	2.0	1.0	4.0	0.0041 <sup>d</sup>	
PCB-141	0.4	2.0	1.0	4.0	0.0029	
PCB-142	0.4	2.0	1.0	4.0	0.0060	
PCB-144	0.4	2.0	1.0	4.0	0.0041	
PCB-145	0.4	2.0	1.0	4.0	0.0109	
PCB-146	0.4	2.0	1.0	4.0	0.0025	
PCB-147/149	0.4	2.0	1.0	4.0	0.0043 <sup>d</sup>	
PCB-148	0.4	2.0	1.0	4.0	0.0036	
PCB-150	0.4	2.0	1.0	4.0	0.0091	
PCB-151/135/154	0.4	2.0	1.0	4.0	0.0041 <sup>d</sup>	
PCB-152	0.4	2.0	1.0	4.0	0.0117	
PCB-153/168	0.4	2.0	1.0	4.0	0.0019 <sup>d</sup>	
PCB-155	0.4	2.0	1.0	4.0	0.0075	
PCB-156/157	0.4	4.0	1.0	8.0	0.0013 <sup>d</sup>	
PCB-158	0.4	2.0	1.0	4.0	0.0018	
PCB-159	0.4	2.0	1.0	4.0	0.0011	
PCB-161	0.1	0.4	1.0	4.0	0.0016	
PCB-162	0.1	0.4	1.0	4.0	0.0011	
PCB-164	0.1	0.4	1.0	4.0	0.0018	
PCB-165	0.1	0.4	1.0	4.0	0.0017	
PCB-167	0.1	0.4	1.0	4.0	0.0010	
PCB-169	0.1	0.4	1.0	4.0	0.0007	
PCB-170	0.1	0.4	1.0	4.0	0.0010	
PCB-171/173	0.1	0.4	1.0	4.0	0.0017 <sup>d</sup>	
PCB-172	0.1	0.4	1.0	4.0	0.0009	
PCB-174	0.1	0.4	1.0	4.0	0.0015	
PCB-175	0.1	0.4	1.0	4.0	0.0013	
PCB-176	0.1	0.4	1.0	4.0	0.0034	
PCB-177	0.1	0.4	1.0	4.0	0.0016	
PCB-178	0.1	0.4	1.0	4.0	0.0014	

**Table C-2. Method and RL goals for PCB congeners in sediment**

Analyte	EPA Method 1668C				Estimated porewater DL (ug/L) <sup>c</sup>	
	Sediment (ng/kg dw) Based on 10-g dw sample		Passive Sampler (pg/g) Based on 1-g PE sample			
	EDL <sup>a</sup>	LMCL <sup>b</sup>	EDL <sup>a</sup>	LMCL <sup>b</sup>		
PCB-179	0.1	0.4	1.0	4.0	0.0036	
PCB-180/193	0.1	0.4	1.0	4.0	0.0007 <sup>d</sup>	
PCB-181	0.1	0.4	1.0	4.0	0.0015	
PCB-182	0.1	0.4	1.0	4.0	0.0012	
PCB-183/185	0.1	0.4	1.0	4.0	0.0014 <sup>d</sup>	
PCB-184	0.1	0.4	1.0	4.0	0.0027	
PCB-186	0.1	0.4	1.0	4.0	0.0040	
PCB-187	0.1	0.4	1.0	4.0	0.0013	
PCB-188	0.1	0.4	1.0	4.0	0.0029	
PCB-189	0.1	0.4	1.0	4.0	0.0004	
PCB-190	0.1	0.4	1.0	4.0	0.0007	
PCB-191	0.1	0.4	1.0	4.0	0.0005	
PCB-192	0.1	0.4	1.0	4.0	0.0006	
PCB-194	0.1	0.4	1.0	4.0	0.0003	
PCB-195	0.1	0.4	1.0	4.0	0.0005	
PCB-196	0.1	0.4	1.0	4.0	0.0004	
PCB-197/200	0.1	0.4	1.0	4.0	0.0010 <sup>d</sup>	
PCB-198/199	0.1	0.4	1.0	4.0	0.0008 <sup>d</sup>	
PCB-201	0.1	0.4	1.0	4.0	0.0005	
PCB-202	0.1	0.4	1.0	4.0	0.0011	
PCB-203	0.1	0.4	1.0	4.0	0.0004	
PCB-204	0.1	0.4	1.0	4.0	0.0010	
PCB-205	0.1	0.4	1.0	4.0	0.0002	
PCB-206	0.1	0.4	1.0	4.0	0.0002	
PCB-207	0.1	0.4	1.0	4.0	0.0004	
PCB-208	0.1	0.4	1.0	4.0	0.0004	
PCB-209	0.1	0.4	1.0	4.0	0.0001	

<sup>a</sup> EDL is a sample-specific DL. The value provided here is an estimate, and the sample-specific values will vary based on sample mass and the analytical conditions at the time of analysis.

<sup>b</sup> LMCL is Axys's lowest calibration limit. Detected values below the LMCL are J-qualified. The reported LMCL will be adjusted based on the sample mass of each sample.

<sup>c</sup> Assuming 0.1g of PE and that full equilibrium is reached for all congeners.

<sup>d</sup> Detection limits for co-elutions were calculated based on the mean of the partition coefficients for the co-eluting congeners.

Axys – Axys Analytical Services, Ltd.

DL – detection limit

LMCL – lower method calibration limit

PCB – polychlorinated biphenyl

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dw – dry weight  
 EPA – US Environmental Protection Agency  
 EDL – estimated detection limit  
 J – estimated concentration

RAO – remedial action objective  
 RL – reporting limit  
 ww – wet weight

**Table C-3. Method and RL goals for dioxins/furan congeners in sediment**

Analyte	EPA Method 1613B			
	Sediment (ng/kg dw) Based on 10-g sample		TEQ (ng/kg)	
	EDL <sup>a</sup>	LMCL <sup>b</sup>	TEF	TEQ <sup>c</sup>
2,3,7,8-TCDD	0.05	0.2	1	0.025
1,2,3,7,8-PeCDD	0.05	1.0	1	0.025
1,2,3,4,7,8-HxCDD	0.05	1.0	0.1	0.0025
1,2,3,6,7,8-HxCDD	0.05	1.0	0.1	0.0025
1,2,3,7,8,9-HxCDD	0.05	1.0	0.1	0.0025
1,2,3,4,6,7,8-HpCDD	0.05	1.0	0.01	0.00025
OCDD	0.05	2.0	0.0003	0.0000075
2,3,7,8-TCDF	0.05	0.2	0.1	0.0025
1,2,3,7,8-PeCDF	0.05	1.0	0.03	0.00075
2,3,4,7,8-PeCDF	0.05	1.0	0.3	0.0075
1,2,3,4,7,8-HxCDF	0.05	1.0	0.1	0.0025
1,2,3,6,7,8-HxCDF	0.05	1.0	0.1	0.0025
1,2,3,7,8,9-HxCDF	0.05	1.0	0.1	0.0025
2,3,4,6,7,8-HxCDF	0.05	1.0	0.1	0.0025
1,2,3,4,6,7,8-HpCDF	0.05	1.0	0.01	0.00025
1,2,3,4,7,8,9-HpCDF	0.05	1.0	0.01	0.00025
OCDF	0.05	2.0	0.0003	0.0000075

<sup>a</sup> EDL is a sample-specific DL. The value provided here is an estimate, and the sample-specific values will vary based on sample mass and the analytical conditions at the time of analysis.

<sup>b</sup> LMCL is Axys's lowest calibration limit. Detected values below the LMCL are J-qualified. The reported LMCL will be adjusted based on the sample mass of each sample.

<sup>c</sup> TEQ calculated using ½ RL value multiplied by the TEF.

Axys – Axys Analytical Services, Ltd.

DL – detection limit

dw – dry weight

EPA – US Environmental Protection Agency

EDL – estimated detection limit

HxCDD – heptachlorodibenzo-p-dioxin

HxCDF – heptachlorodibenzofuran

HxCDF – hexachlorodibenzo-p-dioxin

HxCDF – hexachlorodibenzofuran

LMCL – lower method calibration limit

OCDD – octachlorodibenzo-p-dioxin

OCDF – octachlorodibenzofuran

PeCDD – pentachlorodibenzo-p-dioxin

PeCDF – pentachlorodibenzofuran

RAO – remedial action objective

RL – reporting limit

TCDD – tetrachlorodibenzo-p-dioxin

TCDF – tetrachlorodibenzofuran

TEF – toxic equivalency factor

TEQ – toxic equivalent

ww – wet weight

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
1	X	X	-	-	-	2 8-oz. jars
2	X	X	-	-	-	2 8-oz. jars
3	X	X	-	-	-	2 8-oz. jars
4	X	X	-	-	-	2 8-oz. jars
5	X	X	-	-	-	2 8-oz. jars
6	X	X	-	-	-	2 8-oz. jars
7	X	X	-	-	-	2 8-oz. jars
8	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jar
9	X	X	-	-	-	2 8-oz. jars
10	X	X	-	-	-	2 8-oz. jars
11	X	X	-	-	-	2 8-oz. jars
12	X	X	-	-	-	2 8-oz. jars
13	X	X	-	-	-	2 8-oz. jars
14	X	X	-	-	-	2 8-oz. jars
15	X	X	-	-	-	2 8-oz. jars
16	X	X	-	-	-	2 8-oz. jars
17	X	X	-	-	-	2 8-oz. jars
18	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
19	X	X	-	-	-	2 8-oz. jars
20	X	X	-	-	-	2 8-oz. jars
21	X	X	-	-	-	2 8-oz. jars
22	X	X	-	-	-	2 8-oz. jars
23	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
24	X	X	-	-	-	2 8-oz. jars
25	X	X	-	-	-	2 8-oz. jars
26	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
27	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
28	X	X	-	-	-	2 8-oz. jars
29	X	X	-	-	-	2 8-oz. jars
30	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
31	X	X	-	-	-	2 8-oz. jars
32	X	X	-	-	-	2 8-oz. jars
33	X	X	-	-	-	2 8-oz. jars
34	X	X	-	-	-	2 8-oz. jars
35	X	X	-	-	-	2 8-oz. jars
36	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
37	X	X	-	-	-	2 8-oz. jars
38	X	X	-	-	-	2 8-oz. jars
39	X	X	-	-	-	2 8-oz. jars
40	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
41	X	X	-	-	-	2 8-oz. jars
42	X	X	-	-	-	2 8-oz. jars
43	X	X	-	-	-	2 8-oz. jars
44	X	X	-	-	-	2 8-oz. jars
45	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
46	X	X	-	-	-	2 8-oz. jars
47	X	X	-	-	-	2 8-oz. jars
48	x	x	-	-	-	2 8-oz. jars
49	X	X	-	-	-	2 8-oz. jars
50	X	X	-	-	-	2 8-oz. jars
51	X	X	-	-	-	2 8-oz. jars
52	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
53	X	X	-	-	-	2 8-oz. jars
54	X	X	-	-	-	2 8-oz. jars
55	X	X	-	-	-	2 8-oz. jars
56	X	X	-	-	-	2 8-oz. jars
57	X	X	-	-	-	2 8-oz. jars
58	X	X	-	-	-	2 8-oz. jars
59	X	X	-	-	-	2 8-oz. jars
60	X	X	-	-	-	2 8-oz. jars
61	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
62	X	X	-	-	-	2 8-oz. jars
63	X	X	-	-	-	2 8-oz. jars
64	X	X	-	-	-	2 8-oz. jars
65	X	X	-	-	-	2 8-oz. jars
66	X	X	-	-	-	2 8-oz. jars
67	X	X	-	-	-	2 8-oz. jars
68	X	X	-	-	-	2 8-oz. jars
69	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jar
70	X	X	-	-	-	2 8-oz. jars
71	X	X	-	-	-	2 8-oz. jars
72	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
73	X	X	-	-	-	2 8-oz. jars
74	X	X	-	-	-	2 8-oz. jars
75	X	X	-	-	-	2 8-oz. jars
76	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
77	X	X	-	-	-	2 8-oz. jars
78	X	X	-	-	-	2 8-oz. jars
79	X	X	-	-	-	2 8-oz. jars
80	X	X	-	-	-	2 8-oz. jars
81	X	X	-	-	-	2 8-oz. jars

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**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
82	X	X	-	-	-	2 8-oz. jars
83	X	X	-	-	-	2 8-oz. jars
84	X	X	-	-	-	2 8-oz. jars
85	X	X	-	-	-	2 8-oz. jars
86	X	X	-	-	-	2 8-oz. jars
87	X	X	-	-	-	2 8-oz. jars
88	X	X	-	-	-	2 8-oz. jars
89	X	X	-	-	-	2 8-oz. jars
90	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
91	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
92	X	X	-	-	-	2 8-oz. jars
93	X	X	-	-	-	2 8-oz. jars
94	X	X	-	-	-	2 8-oz. jars
95	X	X	-	-	-	2 8-oz. jars
96	X	X	-	-	-	2 8-oz. jars
97	X	X	-	-	-	2 8-oz. jars
98	X	X	-	-	-	2 8-oz. jars
99	X	X	-	-	-	2 8-oz. jars
100	X	X	-	-	-	2 8-oz. jars
101	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
102	X	X	-	-	-	2 8-oz. jars
103	X	X	-	-	-	2 8-oz. jars
104	X	X	-	-	-	2 8-oz. jars
105	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
106	X	X	-	-	-	2 8-oz. jars
107	X	X	-	-	-	2 8-oz. jars
108	X	X	-	-	-	2 8-oz. jars

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
109	X	X	-	-	-	2 8-oz. jars
110	X	X	-	-	-	2 8-oz. jars
111	X	X	-	-	-	2 8-oz. jars
112	X	X	-	-	-	2 8-oz. jars
113	X	X	-	-	-	2 8-oz. jars
114	X	X	-	-	-	2 8-oz. jars
115	X	X	-	-	-	2 8-oz. jars
116	X	X	-	-	-	2 8-oz. jars
117	X	X	-	-	-	2 8-oz. jars
118	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
119	X	X	-	-	-	2 8-oz. jars
120	X	X	-	-	-	2 8-oz. jars
121	X	X	-	-	-	2 8-oz. jars
122	X	X	-	-	-	2 8-oz. jars
123	X	X	-	-	-	2 8-oz. jars
124	X	X	-	-	-	2 8-oz. jars
125	X	X	-	-	-	2 8-oz. jars
126	X	X	-	-	-	2 8-oz. jars
127	X	X	-	-	-	2 8-oz. jars
128	X	X	-	-	-	2 8-oz. jars
129	X	X	-	-	-	2 8-oz. jars
130	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
131	X	X	-	-	-	2 8-oz. jars
132	X	X	-	-	-	2 8-oz. jars
133	X	X	-	-	-	2 8-oz. jars
134	X	X	-	-	-	2 8-oz. jars
135	X	X	-	-	-	2 8-oz. jars
136	X	X	-	-	X	5 8-oz. jars 3 16-oz. jars
137	X	X	-	-	-	2 8-oz. jars

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
138	X	X	-	-		2 8-oz. jars
139	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
140	X	X	-	-	-	2 8-oz. jars
141	X	X	-	-	-	2 8-oz. jars
142	X	X	-	-	-	2 8-oz. jars
143	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
144	X	X	-	-	-	2 8-oz. jars
145	X	X	-	-	-	2 8-oz. jars
146	X	X	-	-	-	2 8-oz. jars
147	X	X	-	-	-	2 8-oz. jars
148	X	X	-	-	-	2 8-oz. jars
149	X	X	-	-	-	2 8-oz. jars
150	X	X	-	-	-	2 8-oz. jars
151	X	X	-	-	-	2 8-oz. jars
152	X	X	-	-	-	2 8-oz. jars
153	X	X	-	-	-	2 8-oz. jars
154	X	X	-	-	-	2 8-oz. jars
155	X	X	-	-	-	2 8-oz. jars
156	X	X	-	-	-	2 8-oz. jars
157	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars
158	X	X	-	-	-	2 8-oz. jars
159	X	X	-	-	-	2 8-oz. jars
160	X	X	-	-	-	2 8-oz. jars
161	X	X	X	-	-	1 4-oz. jar 4 8-oz. jars 1 16-oz. jars
162	X	X	-	-	-	2 8-oz. jars
163	X	X	-	-	-	2 8-oz. jars
164	X	X	-	-	-	2 8-oz. jars

**Table C-4.Jars for the baseline 0–10-cm sediment samples**

Location	Composite (DQOs 1 and 2) 1–8-oz. Jar	Archive 1–8-oz. Jar	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	PCB Porewater (DQO 5) 2–8-oz. Jar 2–16-oz. Jars	PCB Porewater (DQO 5) Without SMS 3–8-oz. Jar 3–16-oz. Jar	Summary of Jars Needed
165	X	X	-	-	-	2 8-oz. jars
166	X	X	-	-	-	2 8-oz. jars
167	X	X	-	-	-	2 8-oz. jars
168	X	X	X	X	-	1 4-oz. jar 6 8-oz. jars 3 16-oz. jars

DQO – data quality objective

PCB – polychlorinated biphenyl

SMS – Sediment Management Standards

**Table C-5.Intertidal 0–45-cm sediment collection jars**

Location	Location Type	Jars per Subarea or Beach Sample				Jars per Subarea or Beach (Includes Jars for 3 Separate Grabs per Location) <sup>a</sup>	
		Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>b</sup>	Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>c</sup>	Beach Area Composite (DQOs 8 and 9) 1–16-oz. Jar <sup>b</sup>	Beach Area Composite (DQOs 8 and 9) 1–8-oz. Jar <sup>c</sup>	8-oz. Jar	16-oz. Jar
1	clam/beach	X	X	X	-	6	3
2	clam/beach	X	X	X	-	6	3
3	clam	X	X	-	-	6	-
4	clam	X	X	-	-	6	-
5	clam	X	X	-	-	6	-
6	clam	X	X	-	-	6	-
7	clam	X	X	-	-	6	-
8	clam	X	X	-	-	6	-
9	clam	X	X	-	-	6	-
10	clam	X	X	-	-	6	-
11	clam	X	X	-	-	6	-
12	clam	X	X	-	-	6	-
13	clam	X	X	-	-	6	-
14	clam	X	X	-	-	6	-
15	clam/beach	X	X	X	-	6	3
16	clam	X	X	-	-	6	-

**Table C-5. Intertidal 0–45-cm sediment collection jars**

Location	Location Type	Jars per Subarea or Beach Sample				Jars per Subarea or Beach (Includes Jars for 3 Separate Grabs per Location) <sup>a</sup>	
		Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>b</sup>	Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>c</sup>	Beach Area Composite (DQOs 8 and 9) 1–16-oz. Jar <sup>b</sup>	Beach Area Composite (DQOs 8 and 9) 1–8-oz. Jar <sup>c</sup>	8-oz. Jar	16-oz. Jar
17	clam	X	X	-	-	6	-
18	clam	X	X	-	-	6	-
19	clam	X	X	-	-	6	-
20	clam	X	X	-	-	6	-
21	clam/beach	X	X	X	-	6	3
22	clam/beach	X	X	X	-	6	3
23	clam/beach	X	X	X	-	6	3
24	clam/beach	X	X	X	-	6	3
25	clam	X	X	-	-	6	-
26	clam	X	X	-	-	6	-
27	clam	X	X	-	-	6	-
28	clam	X	X	-	-	6	-
29	clam	X	X	-	-	6	-
30	clam/beach	X	X	X	-	6	3
31	clam	X	X	-	-	6	-
32	clam/beach	X	X	X	-	6	3
33	clam/beach	X	X	X	-	6	3
34	clam/beach	X	X	X	-	6	3
35	clam/beach	X	X	X	-	6	3
36	clam	X	X	-	-	6	-
37	clam/beach	X	X	X	-	6	3
38	clam/beach	X	X	X	-	6	3
39	clam	X	X	-	-	6	-
40	clam	X	X	-	-	6	-
41	clam	X	X	-	-	6	-
42	clam/beach	X	X	X	-	6	3
43	clam	X	X	-	-	6	-
44	clam/beach	X	X	X	-	6	3
45	clam/beach	X	X	X	-	6	3
46	clam	X	X	-	-	6	-

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**Table C-5. Intertidal 0–45-cm sediment collection jars**

Location	Location Type	Jars per Subarea or Beach Sample				Jars per Subarea or Beach (Includes Jars for 3 Separate Grabs per Location) <sup>a</sup>	
		Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>b</sup>	Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>c</sup>	Beach Area Composite (DQOs 8 and 9) 1–16-oz. Jar <sup>b</sup>	Beach Area Composite (DQOs 8 and 9) 1–8-oz. Jar <sup>c</sup>	8-oz. Jar	16-oz. Jar
47	clam	X	X	-	-	6	-
48	clam	X	X	-	-	6	-
49	clam	X	X	-	-	6	-
50	clam	X	X	-	-	6	-
51	clam	X	X	-	-	6	-
52	clam	X	X	-	-	6	-
53	clam	X	X	-	-	6	-
54	clam	X	X	-	-	6	-
55	clam	X	X	-	-	6	-
56	clam	X	X	-	-	6	-
57	clam	X	X	-	-	6	-
58	clam	X	X	-	-	6	-
59	clam/beach	X	X	X	-	6	3
60	clam	X	X	-	-	6	-
61	clam/beach	X	X	X	-	6	3
62	clam/beach	X	X	X	-	6	3
63	clam	X	X	-	-	6	-
64	clam	X	X	-	-	6	-
65	clam/beach	X	X	X	-	6	3
66	clam/beach	X	X	X	-	6	3
67	clam/beach	X	X	X	-	6	3
68	clam/beach	X	X	X	-	6	3
69	clam/beach	X	X	X	-	6	3
70	clam/beach	X	X	X	-	6	3
71	clam/beach	X	X	X	-	6	3
72	beach	-	-	X	X	3	3
73	beach	-	-	X	X	3	3
74	beach	-	-	X	X	3	3
75	beach	-	-	X	X	3	3
76	beach	-	-	X	X	3	3

Surface Sediment QAPP

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**Table C-5. Intertidal 0–45-cm sediment collection jars**

Location	Location Type	Jars per Subarea or Beach Sample				Jars per Subarea or Beach (Includes Jars for 3 Separate Grabs per Location) <sup>a</sup>	
		Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>b</sup>	Clam Composite (DQOs 6 and 7) 1–8-oz. Jar <sup>c</sup>	Beach Area Composite (DQOs 8 and 9) 1–16-oz. Jar <sup>b</sup>	Beach Area Composite (DQOs 8 and 9) 1–8-oz. Jar <sup>c</sup>	8-oz. Jar	16-oz. Jar
		-	-	X	X	3	3
77	beach	-	-	X	X	3	3
78	beach	-	-	X	X	3	3
79	beach	-	-	X	X	3	3
80	beach	-	-	X	X	3	3
81	beach	-	-	X	X	3	3
82	beach	-	-	X	X	3	3
83	beach	-	-	X	X	3	3
84	beach	-	-	X	X	3	3
85	beach	-	-	X	X	3	3
86	beach	-	-	X	X	3	3
87	beach	-	-	X	X	3	3

<sup>a</sup> Three separate samples will be collected in close proximity to each other at each location. The jar summary count includes the total number of jars needed for all samples collected at each location.

<sup>b</sup> This jar will be used to create the composite samples for LDW-wide potential clamping area and the beach play areas.

<sup>c</sup> This jar will be archived.

**Table C-6. Near-outfall sediment and individual bank sample collection jars**

Sample	SMS Analysis (DQOs 3 and 4) 1–4-oz. Jar 2–8-oz. Jar 1–16-oz. Jar	Dioxin/Furan 1–8-oz. Jar	Archive 1–8-oz. Jar	Summary of Jars Needed
Near-outfall 0–10-cm sediment	X	X	X	1–4-oz. jar 4–8-oz. jars 1–16-oz. jar
Individual bank samples	X	X	X	1–4-oz. jar 4–8-oz. jars 1–16-oz. jar

DQO – data quality objective

SMS – Washington State Sediment Management Standards